

NOTES ON THE MARINE SHELLS OF WESTERN AUSTRALIA,
WITH DESCRIPTIONS OF NEW SPECIES.

PART I.

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PLATE XXVI.

In December, 1910, and January, 1911, I visited Western Australia and collected shells from the shores at Esperance Bay, Hopetoun, and King George Sound on the south coast; and from Ellensbrook and Yallingup, south of Cape Naturaliste; from Bunbury, and the shores of Rottnest Island. I also dredged a little in Esperance Bay; had two casts with the bucket-dredge in 35 fathoms, a little west of Hopetoun, through the kindness of Captain Walden, of the S.S. "Ferret"; a good deal of dredging in 12 to 14 fathoms and 22 to 28 fathoms, and 35 fathoms in King George Sound; a good deal in Geographe Bay in 15 and in 22 fathoms; and several casts off Fremantle, in 6 fathoms and in 15 fathoms from the Government tug-boat "Penguin," through the kindness of Captain Winzor (the harbour master) and of Captain Airey (master of the "Penguin").

I propose, therefore, as I take up the different genera and deal with my more extensive South Australian material to identify and record also all known Western Australian forms gathered by me, and describe any new species found.

I may say that of more than 400 different species collected in the West the very large majority of them are identical with or closely resemble our "Adelaidean fauna," as Mr. Hedley has called it.

Dentalium intercalatum, Gould.

Dredged in 10 to 12 fathoms off Fremantle, 2 fragments, with valid narrow ribs and intercalated riblets, recalling the above species.

Dentalium francisense, Verco, *antea*.

Dredged in 35 fathoms off Hopetoun, 1 moderately good with an appendix; in Geographe Bay in 15 fathoms, 4 moderate; in 22 fathoms, 2 good and 6 moderate; off Fremantle in 6 fathoms, 1 good; and in 10 to 12 fathoms, 1 poor. Taken on Bunbury Beach, 4 rolled; and on Rottnest Island, 2 rolled.

Dentalium hyperhemileuron, n. sp. Pl. xxvi,
figs. 3 and 3a.

Shell long and narrow, very slightly curved, mostly at the hinder part, white when dead, translucent when fresh, and glistening, rather thin. There are 12 axial ribs, invalid, and narrow; no increase in number with age; becoming obsolete early, so as to leave the anterior two-thirds of shell smooth but for very fine accremental scratch lines. Interstices nearly flat, slightly concave. Anterior orifice round, margin thin and simple. Posterior end truncated, with a long narrow diaphanous appendix directed eccentrically dorsally. The growth lines on the appendix form a convexly bordered sinus on the ventral surface about as wide as deep, and a scarcely depressed margin on the dorsal surface.

Dimensions.—Length, 20·5 mm.; greatest width, 1·8 mm.; least width, 7 mm.; length of appendix, 2·2 mm.; diameter, 4 mm.

Locality.—King George Sound, Western Australia, in 12-14 fathoms, 200, several alive; in 22-28 fathoms, 60, several alive; in 35 fathoms, 4 dead but good; Geographe Bay in 15 fathoms, 6 dead but good; in 22 fathoms, 4 dead; off Fremantle in 10-12 fathoms, 20 poor.

Some individuals with perfect posterior ends run down to a diameter of 3 mm., and are there diaphanous and ribless, and have only growth striæ. Others more mature and with a posterior end of 1 mm. in diameter, and without an appendix, are here bevelled internally and thinner on the convex side, where there is a shallow triangular notch. The largest example is 30·75 mm. long by 2·3 mm. wide. The ribs may vary in number from 10 to 16 in different individuals.

Diagnosis.—It very closely resembles *D. hemileuron*, Verco, in the ribless anterior portion and the never-increasing ribs of the posterior end, and in their extension to within 2 mm. of the end in very young individuals and in the ventral notch at the hinder extremity; but the latter has no appendix, and the ribs are more valid and do not so soon become obsolete, and it is not found in such shallow water. But I think probably the absence of the appendix may be only an accidental circumstance, and the shallower water in which the Western Australian species lives may account for the other differences, and that this is only a local variety.

One individual, dredged in Geographe Bay at a depth of 15 fathoms, measures 4 mm. in length by 5 mm. in diameter at the anterior end. It has the apical end complete. The first portion of this, measuring 1·9 mm., has been

figured, and shows an initial elliptical section '35 mm. in length by '22 mm. in greatest width, and having a round hole in its end of about '15 mm. in diameter with a simple border; a second curved cylindrical section of '36 mm. long by '20 wide; a third slightly conical section of '60 mm. long by '35 mm. wide in its greatest diameter; and a fourth section of '65 mm. long by '40 mm. wide. The second section has its walls slightly corrugated, so as to give them a faintly undulating outline, with broad shaded transverse bands, which are visible also in the anterior half of the first section. The third segment is smooth but for very fine accremental transverse scratches. The fourth shows the commencement of the axial ribs, which gradually enlarge with the growth of the shell.

As this example so beautifully reveals the beginning of a *Dentalium* I have had it figured.

Type in Dr. Verco's collection.

***Dentalium lubricatum*, Sowerby.**

Dredged off Hopetoun in 35 fathoms, 5 good, dead.

***Cadulus occiduus*, n. sp. Pl. xxvi., fig. 7.**

Shell rather solid; ventral curve nearly uniformly slightly convex, more at the posterior part; dorsal side nearly straight in the anterior fourth, slightly convex in the next quarter, and slightly concave in the hinder half. It is cut off perpendicularly to the axis behind, rather obliquely in front, where the slope is backward toward the convex side. There is a slight dorso-ventral compression of the tube, so that both the apertures are slightly flattened, especially on the convex side. Surface smooth but for scanty transverse microscopic scratches. Colour white, more opaque anteriorly, and in transverse lines.

Dimensions.—Length, 9·6 mm.; anterior diameter, 1 mm.; posterior, '5 mm.; greatest diameter, 1·4 mm.

Locality.—Geographe Bay, off Bunbury, in 15 fathoms, type with 7 others; off Fremantle in 10 to 12 fathoms, very many.

Among the many specimens taken considerable variety obtains. Some full grown may measure only 5 mm. in length and be proportionally narrow, and the inflation on the concave side may be less in all degrees, almost to disappearance.

***Cadulus angustior*, Verco, *antea*.**

Dredged in 35 fathoms off Hopetoun, 3 good; in King George Sound in 12-14 fathoms, 40 good; in Geographe Bay in 15 fathoms, 30 good.

EXPLANATION OF PLATES.

PLATE XXVI.

1. *Dentalium francisense*, Verco, n. sp.
- 1a. " " " " young.
2. " *hemileuron*, Verco, n. sp.
3. " *hyperhemileuron*, Verco, n. sp.
- 3a. " " " " early stage.
4. " *lubricatum*, Sowerby, " " early stage.
- 4a. " " " " apex.
5. *Cadulus angustior*, Verco, n. sp.
- 5a. " " " " initial stage.
- 5b. " " " " medium stage.
6. " *gibbosus*, Verco, n. sp.
7. " *occiduus*, Verco, n. sp.

PLATE XXVII.

- 1 to 6. *Turbo jourdani*, Kiener, half of one row from the radula.
- 1, 2, 3. " " " " marginal teeth.
- 4, 5. " " " " lateral teeth.
6. " " " " central tooth.
- 1a. " " " " outermost marginals.
- 2a. " " " " inner marginals.
- 3a. " " " " innermost maginal.
- 4a. " " " " outermost lateral.
- 5a. " " " " other laterals.
- 6a. " " " " central.
7. *Dentalium zelandicum*, Sowerby, one row from the radula.